

# PATENT ABSTRACTS OF JAPAN

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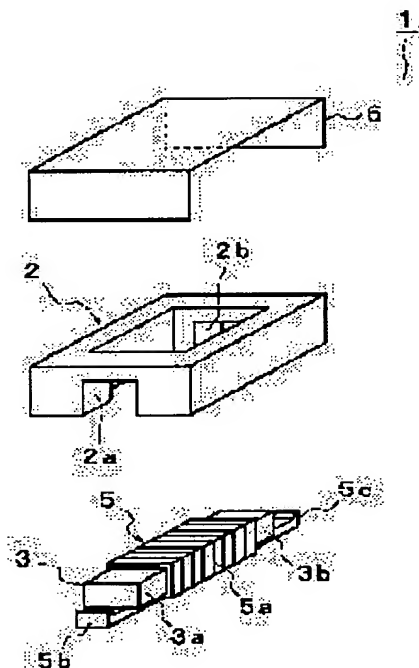
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## (54) WINDING-WIRE COMPONENT

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To attain thinning, miniaturization and cost reduction for a choke coil or transformer of large current.

**SOLUTION:** A stepped band-like straight wire 5 is wound spirally around an I-shaped core 3, and connecting terminal parts 5b and 5c are formed at both the terminals of the straight wire 5. The I-shaped core 3 and the straight wire 5 are engaged to a frame core 2, and a tape 6 is provided to seal the upper surfaces and side faces of the I-shaped core 3 and the frame core 2, so that a choke coil 1 can be configured. Thus, the laminating direction of the straight wire 5 is matched with the lengthwise direction of the choke coil 1, and even if the winding number of the straight wire 5 is increased, the total height of the choke coil 1 will not increase. As a result, thinning can be provided in spite of a large current. A filler can be injected, without having to use a resin case, the choke coil 1 is made smaller by the amount of the resin case and material costs are reduced as well.



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## CLAIMS

[Claim(s)]

- [Claim 1] The coil parts characterized by having adopted the straight angle line (5) band-like [with the stage] as the aforementioned lead wire, and forming a connection terminal area (5b, 5c) in the ends of this straight angle line in the coil parts (1) which engaged lead wire with the circumference of I form core (3), and made winding, these I type core, and lead wire engage with a frame core (2) spirally.
- [Claim 2] The coil parts characterized by having adopted the straight angle line (15) band-like [nothing / stage] as the aforementioned lead wire, and forming a connection terminal area (15b, 15c) in the ends of this straight angle line in the coil parts (1) which engaged lead wire with the circumference of I form core (3), and made winding, these I type core, and lead wire engage with a frame core (2) spirally.
- [Claim 3] The coil part according to claim 1 or 2 characterized by filling up the crevice between the aforementioned I form core and the aforementioned frame core with the bulking agent which prepares a tape (6) so that the seal of the upper surface and the side of I form core (3) and a frame core (2) may be carried out, and has thermal conductivity.
- [Claim 4] The coil parts characterized by having adopted the straight angle line (5) band-like [with the stage] as the aforementioned lead wire, and forming a connection terminal area (5b, 5c) in the ends of this straight angle line in the coil parts (1) which engaged lead wire with the circumference of I form core (13), and made winding, these I type core, and lead wire engage with a C core (12) spirally.
- [Claim 5] The coil parts characterized by having adopted the straight angle line (15) band-like [nothing / stage] as the aforementioned lead wire, and forming a connection terminal area (15b, 15c) in the ends of this straight angle line in the coil parts (11) which engaged lead wire with the circumference of I form core (13), and made winding, these I type core, and lead wire engage with a C core (12) spirally.
- [Claim 6] The coil part according to claim 4 or 5 characterized by filling up the crevice between the aforementioned I form core and the aforementioned C core with the bulking agent which prepares a tape (6) so that the seal of the upper surface and the side of I form core (13) and a C core (12) may be carried out, and has thermal conductivity.

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001] [The technical field to which invention belongs] this invention relates to coil parts, such as a choke coil for high currents, and a transformer.

[0002] [Description of the Prior Art] Drawing 5 is the perspective diagram showing an example of the conventional choke coil.

[0003] Since this has the fault that the line moment is bad although the cross section of a wire is a circle therefore, although there are some which wound the wire around the core as a conventional choke coil, as recently shows to drawing 5, the choke coil 21 to which attached the straight angle line 25 in winding, and only predetermined number of turns attached this in height 23a of the ER cores 22 and 23 of a couple is used widely spirally.

[0004]

[Problem(s) to be Solved by the Invention] However, in this choke coil 21, since the direction of a laminating of the straight angle line 25 is in agreement in the height direction of a choke coil 21, if the number of turns of the straight angle line 25 are increased that it should correspond to a high current, the total amount of a choke coil 21 will increase inevitably. Therefore, a result which does not meet the request of thin-shape-izing of the choke coil 21 in recent years is brought.

[0005] Moreover, since generation of heat at the time of use of a choke coil 21 is eased, although the circumference of the straight angle line 25 may be filled up with a bulking agent with thermal conductivity, since the ER cores 22 and 23 were contained in the resin case (not shown) with the straight angle line 25 in this case and the bulking agent was poured in into it, the cost of materials will go up to \*\*\* to which a choke coil 21 enlarges only the part of a resin case.

[0006] This is the same also about coil parts other than choke coil 21 (for example, transformer).

[0007] this invention aims at offering the coil parts which thin shape-ization can be realized though it is an object for high currents, a resin case is excluded in view of such a situation, and can plan a miniaturization and cost reduction.

[0008]

[Means for Solving the Problem] That is, in the coil parts (1) with which invention which relates to a claim 1 among this inventions engaged lead wire with the circumference of I form core (3), and made winding, these I type core, and lead wire engage with a frame core (2) spirally, a straight angle line (5) band-like [ with the stage ] is adopted as the aforementioned lead wire, and a connection terminal area (5b, 5c) is formed in the ends of this straight angle line, and it is constituted.

[0009] Moreover, in the coil parts (1) with which invention which relates to a claim 2 among this inventions engaged lead wire with the circumference of I form core (3), and made winding, these I type core, and lead wire engage with a frame core (2) spirally, a straight angle line (15) band-like [ nothing / stage ] is adopted as the aforementioned lead wire, and a connection terminal area (15b, 15c) is formed in the ends of this straight angle line, and it is constituted.

[0010] By adopting such composition, the direction of a laminating of a straight angle line will be in agreement in the length direction of a choke coil, and even if it increases the number of turns of a straight angle line that it should correspond to a high current, it acts so that the total amount of a choke coil will not increase.

[0011] Moreover, invention which relates to a claim 3 among this inventions prepares a tape (6) so that the seal of the upper surface and the side of the above-mentioned I form core (3) and the above-mentioned frame core (2) may be carried out, fills up the crevice between the aforementioned I form core and the aforementioned frame core with a bulking agent with thermal conductivity, and is constituted.

[0012] By this composition, even if it does not use a resin case, a bulking agent can be poured in.

[0013] In the coil parts (11) with which invention which relates to a claim 4 among this inventions engaged lead wire with the circumference of I form core (13) on the other hand, and made winding, these I type core, and lead wire engage with a C core (12) spirally, a straight angle line (5) band-like [ with the stage ] is adopted as the aforementioned lead wire, and a connection terminal area (5b, 5c) is formed in the ends of this straight angle line, and it is constituted.

[0014] Moreover, in the coil parts (11) with which invention which relates to a claim 5 among this inventions engaged lead wire with the circumference of I form core (13), and made winding, these I type core, and lead wire engage with a C core (12) spirally, a straight angle line (15) band-like [ nothing / stage ] is adopted as the aforementioned lead wire, and a connection terminal area (15b, 15c) is formed in the ends of this straight angle line, and it is constituted.

[0015] By adopting such composition, the direction of a laminating of a straight angle line will be in agreement in the length direction of a choke coil, and even if it increases the number of turns of a straight angle line that it should correspond to a high current, it acts so that the total amount of a choke coil will not increase.

[0016] Furthermore, invention which relates to a claim 6 among this inventions prepares a tape (6) so that the seal of the upper surface and the side of the above-mentioned I form core (13) and the above-mentioned C core (12) may be carried out, fills up the crevice between the aforementioned I form core and the aforementioned C core with a bulking agent with thermal conductivity, and is constituted.

[0017] By this composition, even if it does not use a resin case, a bulking agent can be poured in.

[0018] Here, a straight angle line means the lead wire which has the rectangular section, and what covered urethane, the enamel, etc. is included.

[0019] In addition, the sign in a parenthesis does not express the element which corresponds in a drawing, and the limited restraint of this invention is not carried out [ expedient / therefore ] at the publication on a drawing. This is the same also about the column of a "claim."

[0020]

[Embodiments of the Invention] Hereafter, the operation gestalt of this invention is explained based on a drawing.

[0021] The decomposition perspective diagram showing the 1st operation gestalt (choke coil which combined the frame core and I form core) of the coil parts which <operation gestalt of \*\* 1st> drawing 1 requires for this invention, Drawing 2 is drawing showing the winding state of the straight angle line of the choke coil shown in drawing 1. The front view and (c) are drawings in which (a) shows the plan and (b) shows the expansion state of the straight angle line of a choke coil where the left lateral view and (f) are shown in the right lateral view, and the rear view and (d) show drawing 3 to drawing 1, (a) is the plan and (b) of the bottom plan view and (e) is the front view.

[0022] This choke coil 1 has the frame core 2, as shown in drawing 1, and the two notching sections 2a and 2b are formed in the frame core 2. The I form core 3 is combined with this frame core 2 in the form where the both ends 3a and 3b are made to engage with the notching sections 2a and 2b, and the straight angle line 5 band-like [ with the stage ] is spirally wound around the circumference of the I form core 3 by one layer.

[0023] That is, this straight angle line 5 has substrate 5a band-like [ with the stage ], as shown

in drawing 3, and the connection terminal areas 5b and 5c are set up by the ends of substrate 5a. By bending substrate 5a of this straight angle line 5 right-angled by the position (arrow part of drawing 3 (a)), as shown in drawing 2, substrate 5a becomes rectangular pipe-like, and it will be in the state where the connection terminal areas 5b and 5c have arranged to the ends.

[0024] Furthermore, the tape 6 is stuck on the frame core 2 and the I form core 3 so that the seal of the upper surface and side may be carried out, as shown in drawing 1, and the device between the frame core 2 and the I form core 3 is filled up with the bulking agent (not shown) with thermal conductivity. In addition, what is necessary is to make the upper and lower sides reverse and to just be filled up from the bottom at the time of this restoration.

[0025] Since it has the above composition, even if the direction of a laminating of the straight angle line 5 increases the number of turns of the straight angle line 5 that it will be in agreement in the length direction (the height direction and direction which intersects perpendicularly) of a choke coil 1, and should correspond to a high current, the total amount of a choke coil 1 of a choke coil 1 does not increase. Therefore, though it is an object for high currents, it becomes possible to realize thin shape-ization, and it can respond to the request of thin-shape-izing of the choke coil 1 in recent years.

[0026] Moreover, since it is not necessary to use a resin case for pouring in a bulking agent unlike the former, while enlargement of a choke coil 1 is avoidable, it becomes possible to cut down the cost of materials of a resin case.

[0027] Furthermore, since it is not necessary to coil the straight angle line 5 aslant to the I form core 3 in case a choke coil 1 is manufactured, the productivity of a choke coil 1 can be raised.

[0028] In addition, although the choke coil 1 which combined winding and this with the frame core 2 spirally was explained in the 1st operation gestalt mentioned above, bending the straight angle line 5 band-like [with the stage] around the I form core 3. The configuration of the winding method of a straight angle line or a core is not necessarily restricted to this, for example, is replaced with the straight angle line 5 band-like [with the stage], can use a straight angle line band-like [nothing / stage], can replace it with the frame core 2, and can also use a C core. Hereafter, the choke coil which combined winding and this with the C core spirally is explained, bending a straight angle line band-like [nothing / stage] around I form core as 2nd operation gestalt.

[0029] <Operation gestalt of \*\* 2nd> drawing 4 is drawing showing the 2nd operation gestalt (choke coil which combined the C core and I form core) of the coil parts concerning this invention, and (a) is [the front view and (c of the plan and (b)) ] the right lateral view.

[0030] This choke coil 11 has C core 12, as shown in drawing 4, and the I form core 13 is engaging with C core 12. The straight angle line 15 band-like [nothing / stage] is spirally wound around the circumference of the I form core 13 by one layer, and the connection terminal areas 15b and 15c are formed in the ends of substrate 15a of the straight angle line 15.

[0031] Therefore, this choke coil 11 like the choke coil 1 mentioned above. Since the total amount of a choke coil 11 does not increase even if the direction of a laminating of the straight angle line 15 increases the number of turns of the straight angle line 15 in accordance with the length direction (the height direction and direction which intersects perpendicularly) of a choke coil 11 that it should correspond to a high current. Though it is an object for high currents, it becomes possible to realize thin shape-ization, and it can respond to the request of thin-shape-izing of the choke coil 11 in recent years.

[0032] It does not matter even if it may combine winding and this with the frame core 2 spirally, bending the straight angle line 15 band-like [nothing / stage] around the <other operation gestalt> I type core 3, and it combines winding and this with C core 12 spirally, bending the straight angle line 5 band-like / with the stage / around the I form core 13.

[0033]

[Effect of the Invention] According to invention which relates to claims 1, 2, 4, and 5 among this inventions, as explained above, the direction of a laminating of a straight angle line will be in agreement in the length direction of a choke coil, and since the total amount of a choke coil will not increase even if it increases the number of turns of a straight angle line that it should correspond to a high current, though it is an object for high currents, the coil parts which can

realize thin shape-ization can be offered.

[0034] Moreover, since according to invention which relates to claims 3 and 6 among this inventions in addition to the operation effect mentioned above a bulking agent can be poured in even if it does not use a resin case, it becomes possible to exclude a resin case and to plan a miniaturization and cost reduction.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

- [Drawing 1] It is the decomposition perspective diagram showing the 1st operation gestalt (choke coil which combined the frame core and I form core) of the coil parts concerning this invention.
- [Drawing 2] It is drawing showing the winding state of the straight angle line of the choke coil shown in drawing 1, and, for the front view and (c), the rear view and (d) are [ (a) / the plan and (b) / the left lateral view and (f of the bottom plan view and (e)) ] the right lateral view.
- [Drawing 3] It is drawing showing the expansion state of the straight angle line of the choke coil shown in drawing 1, and (a) is the plan and (b) is the front view.
- [Drawing 4] It is drawing showing the 2nd operation gestalt (choke coil which combined the C core and I form core) of the coil parts concerning this invention, and (a) is [ the front view and (c of the plan and (b)) ] the right lateral view.
- [Drawing 5] It is the perspective diagram showing an example of the conventional choke coil.
- [Description of Notations]
- 1 11 ... Coil parts (choke coil)
  - 2 ... Frame core
  - 3 13 ... I form core
  - 5 ... Straight angle line band-like [ with the stage ]
  - 5b, 5c ... Connection terminal area
  - 6 ... Tape
  - 12 ... C core
  - 15 ... Straight angle line band-like [ nothing / stage ]
  - 15b, 15c ... Connection terminal area

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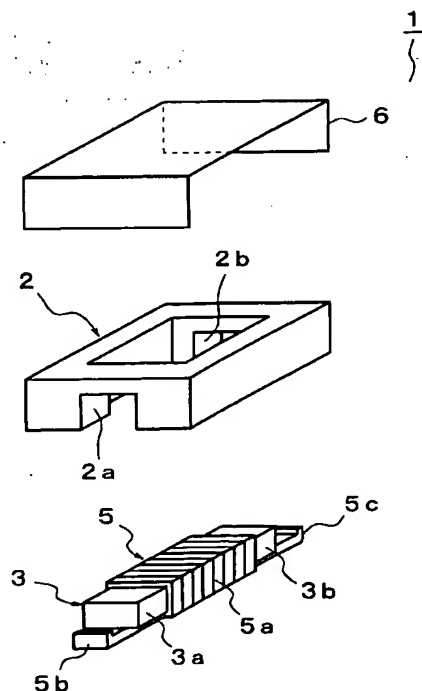
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(54) 【発明の名称】 巻線部品

(57) 【要約】

【課題】 大電流用のチョークコイルやトランスにおいて、その薄型化、小型化およびコスト削減を図る。

【解決手段】 段付き帯状の平角線5をI形コア3の周囲に螺旋状に巻回し、平角線5の両端に接続端子部5b、5cを形成する。I形コア3および平角線5を枠コア2に係合させ、I形コア3および枠コア2の上面および側面をシールするようにテープ6を設けて、チョークコイル1を構成する。これにより、平角線5の積層方向がチョークコイル1の長さ方向に一致し、平角線5の巻数を増やしてもチョークコイル1の総高は増加しなくなる。その結果、大電流用でありながら薄型化を実現できる。樹脂ケースを用いなくても充填剤を注入できるようになり、樹脂ケースの分だけチョークコイル1が小さくなり、材料費も少なくて済む。



**【特許請求の範囲】**

【請求項1】 I形コア(3)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線を枠コア(2)に係合させた巻線部品(1)において、段付き帯状の平角線(5)を前記導線として採用し、この平角線の両端に接続端子部(5b、5c)を形成したことを特徴とする巻線部品。

【請求項2】 I形コア(3)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線を枠コア(2)に係合させた巻線部品(1)において、段なし帯状の平角線(15)を前記導線として採用し、この平角線の両端に接続端子部(15b、15c)を形成したことを特徴とする巻線部品。

【請求項3】 I形コア(3)および枠コア(2)の上面および側面をシールするようにテープ(6)を設け、熱伝導性のある充填剤を前記I形コアと前記枠コアとの隙間に充填したことを特徴とする請求項1または請求項2に記載の巻線部品。

【請求項4】 I形コア(13)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線をC形コア(12)に係合させた巻線部品(11)において、段付き帯状の平角線(5)を前記導線として採用し、この平角線の両端に接続端子部(5b、5c)を形成したことを特徴とする巻線部品。

【請求項5】 I形コア(13)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線をC形コア(12)に係合させた巻線部品(11)において、段なし帯状の平角線(15)を前記導線として採用し、この平角線の両端に接続端子部(15b、15c)を形成したことを特徴とする巻線部品。

【請求項6】 I形コア(13)およびC形コア(12)の上面および側面をシールするようにテープ(6)を設け、熱伝導性のある充填剤を前記I形コアと前記C形コアとの隙間に充填したことを特徴とする請求項4または請求項5に記載の巻線部品。

**【発明の詳細な説明】****【0001】**

【発明の属する技術分野】本発明は、大電流用のチョークコイルやトランスなどの巻線部品に関するものである。

**【0002】**

【従来の技術】図5は従来のチョークコイルの一例を示す斜視図である。

【0003】従来のチョークコイルとしては丸線をコアに巻回したものがあるが、これは丸線の断面が円であるが故に線積率が悪いという欠点があることから、最近では、図5に示すように、平角線25を螺旋状に所定巻数だけ巻回し、これを一對のERコア22、23の突起部23aに嵌着したチョークコイル21が広く用いられている。

**【0004】**

【発明が解決しようとする課題】しかし、このチョークコイル21では平角線25の積層方向がチョークコイル21の高さ方向に一致しているので、大電流に対応すべく平角線25の巻数を増やすと、必然的にチョークコイル21の総高が増してしまう。そのため、近年におけるチョークコイル21の薄型化の要請に沿わない結果となる。

【0005】また、チョークコイル21の使用時の発熱を緩和するため、熱伝導性のある充填剤を平角線25の周囲に充填する場合があるが、この場合、ERコア22、23を平角線25とともに樹脂ケース(図示せず)に収納し、その中に充填剤を注入していたので、樹脂ケースの分だけチョークコイル21が大型化する同時に材料費が上昇してしまう。

【0006】このことはチョークコイル21以外の巻線部品(例えば、トランス)についても同様である。

【0007】本発明は、このような事情に鑑み、大電流用でありながら薄型化を実現することができ、樹脂ケースを省いて小型化およびコスト削減を図ることが可能な巻線部品を提供することを目的とする。

**【0008】**

【課題を解決するための手段】すなわち、本発明のうち請求項1に係る発明は、I形コア(3)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線を枠コア(2)に係合させた巻線部品(1)において、段付き帯状の平角線(5)を前記導線として採用し、この平角線の両端に接続端子部(5b、5c)を形成して構成される。

【0009】また、本発明のうち請求項2に係る発明は、I形コア(3)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線を枠コア(2)に係合させた巻線部品(1)において、段なし帯状の平角線(15)を前記導線として採用し、この平角線の両端に接続端子部(15b、15c)を形成して構成される。

【0010】こうした構成を採用することにより、平角線の積層方向がチョークコイルの長さ方向に一致することになり、大電流に対応すべく平角線の巻数を増やしても、チョークコイルの総高が増加しなくなるように作用する。

【0011】また、本発明のうち請求項3に係る発明は、上記I形コア(3)および上記枠コア(2)の上面および側面をシールするようにテープ(6)を設け、熱伝導性のある充填剤を前記I形コアと前記枠コアとの隙間に充填して構成される。

【0012】かかる構成により、樹脂ケースを用いなくても充填剤を注入できるようになる。

【0013】一方、本発明のうち請求項4に係る発明は、I形コア(13)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線をC形コア(12)に係合さ



せた巻線部品(11)において、段付き帯状の平角線(5)を前記導線として採用し、この平角線の両端に接続端子部(5b、5c)を形成して構成される。

【0014】また、本発明のうち請求項5に係る発明は、I形コア(13)の周囲に導線を螺旋状に巻回し、これらI形コアおよび導線をC形コア(12)に係合させた巻線部品(11)において、段なし帯状の平角線(15)を前記導線として採用し、この平角線の両端に接続端子部(15b、15c)を形成して構成される。

【0015】こうした構成を採用することにより、平角線の積層方向がチョークコイルの長さ方向に一致することになり、大電流に対応すべく平角線の巻数を増やしても、チョークコイルの総高が増加しなくなるように作用する。

【0016】さらに、本発明のうち請求項6に係る発明は、上記I形コア(13)および上記C形コア(12)の上面および側面をシールするようにテープ(6)を設け、熱伝導性のある充填剤を前記I形コアと前記C形コアとの隙間に充填して構成される。

【0017】かかる構成により、樹脂ケースを用いなくとも充填剤を注入できるようになる。

【0018】ここで、平角線とは長方形断面を有する導線を意味し、ウレタンやエナメル等の被覆を施したものを含む。

【0019】なお、括弧内の符号は図面において対応する要素を表す便宜的なものであり、したがって、本発明は図面上の記載に限定拘束されるものではない。このこととは、「特許請求の範囲」の欄についても同様である。

【0020】

【発明の実施の形態】以下、本発明の実施形態を図面に基づいて説明する。

【0021】＜第1の実施形態＞図1は本発明に係る巻線部品の第1の実施形態(枠コアとI形コアを組み合わせたチョークコイル)を示す分解斜視図、図2は図1に示すチョークコイルの平角線の巻回状態を示す図であって、(a)はその平面図、(b)はその正面図、(c)はその背面図、(d)はその底面図、(e)はその左側面図、(f)はその右側面図、図3は図1に示すチョークコイルの平角線の展開状態を示す図であって、(a)はその平面図、(b)はその正面図である。

【0022】このチョークコイル1は、図1に示すように、枠コア2を有しており、枠コア2には2個の切り欠き部2a、2bが形成されている。この枠コア2にはI形コア3がその両端部3a、3bを切り欠き部2a、2bに係合させる形で組み合わされており、I形コア3の周囲には段付き帯状の平角線5が螺旋状に1層で巻回されている。

【0023】すなわち、この平角線5は、図3に示すように、段付き帯状の基板5aを有しており、基板5aの両端には接続端子部5b、5cが立設されている。この

平角線5の基板5aを所定の位置(図3(a)の矢印部位)で直角に折り曲げることで、図2に示すように、基板5aが角筒状になり、その両端に接続端子部5b、5cが配置した状態となる。

【0024】さらに、枠コア2およびI形コア3には、図1に示すように、その上面および側面をシールするようにテープ6が貼設されており、枠コア2とI形コア3との隙間には熱伝導性のある充填剤(図示せず)が充填されている。なお、この充填時には、上下を逆さにして下側から充填すればよい。

【0025】チョークコイル1は以上のような構成を有するので、平角線5の積層方向がチョークコイル1の長さ方向(高さ方向と直交する方向)に一致することになり、大電流に対応すべく平角線5の巻数を増やしても、チョークコイル1の総高が増すことはない。そのため、大電流用でありながら薄型化を実現することが可能となり、近年におけるチョークコイル1の薄型化の要請に応えることができる。

【0026】また、従来と違って、充填剤を注入するのに樹脂ケースを用いる必要がないので、チョークコイル1の大型化を避けることができるとともに、樹脂ケースの材料費を節約することが可能となる。

【0027】さらに、チョークコイル1を製造する際に、平角線5をI形コア3に対して斜めに巻く必要がないため、チョークコイル1の生産性を高めることができる。

【0028】なお、上述した第1の実施形態においては、I形コア3の周囲に段付き帯状の平角線5を折り曲げつつ螺旋状に巻回し、これを枠コア2と組み合わせたチョークコイル1について説明したが、平角線の巻回方法やコアの形状はこれに限るわけではなく、例えば、段付き帯状の平角線5に代えて段なし帯状の平角線を使い、枠コア2に代えてC形コアを用いることもできる。以下、第2の実施形態として、I形コアの周囲に段なし帯状の平角線を折り曲げつつ螺旋状に巻回し、これをC形コアと組み合わせたチョークコイルについて説明する。

【0029】＜第2の実施形態＞図4は本発明に係る巻線部品の第2の実施形態(C形コアとI形コアを組み合わせたチョークコイル)を示す図であって、(a)はその平面図、(b)はその正面図、(c)はその右側面図である。

【0030】このチョークコイル11は、図4に示すように、C形コア12を有しており、C形コア12にはI形コア13に係合している。I形コア13の周囲には段なし帯状の平角線15が螺旋状に1層で巻回されており、平角線15の基板15aの両端には接続端子部15b、15cが設けられている。

【0031】したがって、このチョークコイル11は、上述したチョークコイル1と同様、平角線15の積層方

向がチョークコイル11の長さ方向（高さ方向と直交する方向）に一致し、大電流に対応すべく平角線15の巻数を増やしても、チョークコイル11の総高が増加しないので、大電流用でありながら薄型化を実現することが可能となり、近年におけるチョークコイル11の薄型化の要請に応えることができる。

【0032】＜その他の実施形態＞I形コア3の周囲に段なし帯状の平角線15を折り曲げつつ螺旋状に巻回し、これを枠コア2と組み合わせてもよく、I形コア13の周囲に段付き帯状の平角線5を折り曲げつつ螺旋状に巻回し、これをC形コア12と組み合わせても構わない。

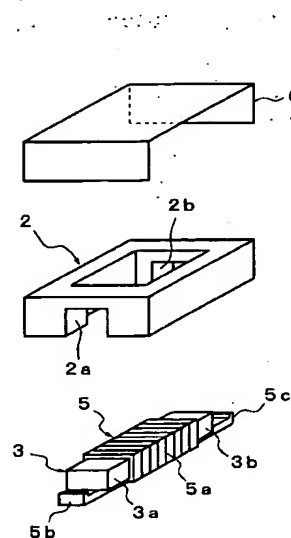
【0033】

【発明の効果】以上説明したように、本発明のうち請求項1、2、4、5に係る発明によれば、平角線の積層方向がチョークコイルの長さ方向に一致することになり、大電流に対応すべく平角線の巻数を増やしても、チョークコイルの総高が増加しなくなることから、大電流用でありながら薄型化を実現しうる巻線部品を提供することができる。

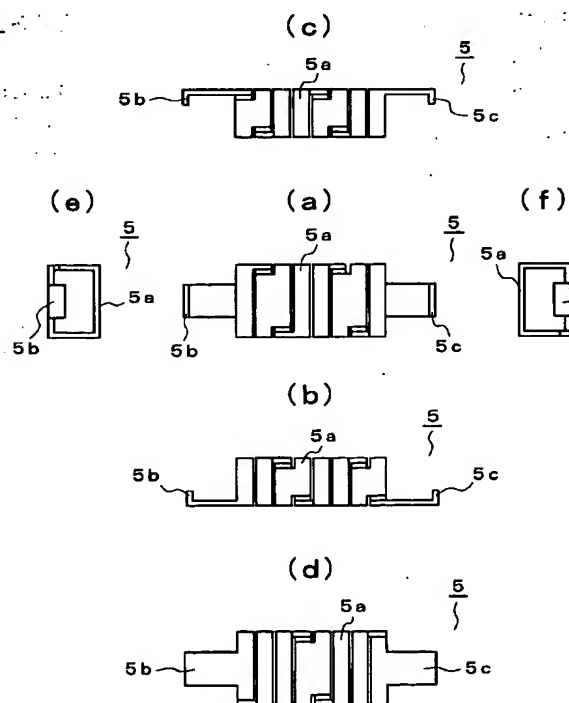
【0034】また、本発明のうち請求項3、6に係る発明によれば、上述した作用効果に加えて、樹脂ケースを用いなくても充填剤を注入できるようになるため、樹脂ケースを省いて小型化およびコスト削減を図ることが可能となる。

【図面の簡単な説明】

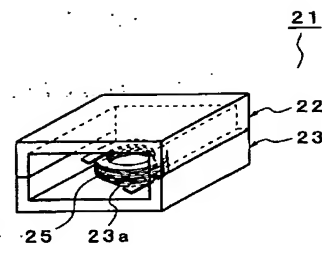
【図1】



【図2】



【図5】



【図1】本発明に係る巻線部品の第1の実施形態（枠コアとI形コアを組み合わせたチョークコイル）を示す分解斜視図である。

【図2】図1に示すチョークコイルの平角線の巻回状態を示す図であって、（a）はその平面図、（b）はその正面図、（c）はその背面図、（d）はその底面図、（e）はその左側面図、（f）はその右側面図である。

【図3】図1に示すチョークコイルの平角線の展開状態を示す図であって、（a）はその平面図、（b）はその正面図である。

【図4】本発明に係る巻線部品の第2の実施形態（C形コアとI形コアを組み合わせたチョークコイル）を示す図であって、（a）はその平面図、（b）はその正面図、（c）はその右側面図である。

【図5】従来のチョークコイルの一例を示す斜視図である。

【符号の説明】

1、11……巻線部品（チョークコイル）

2……枠コア

3、13……I形コア

5……段付き帯状の平角線

5b、5c……接続端子部

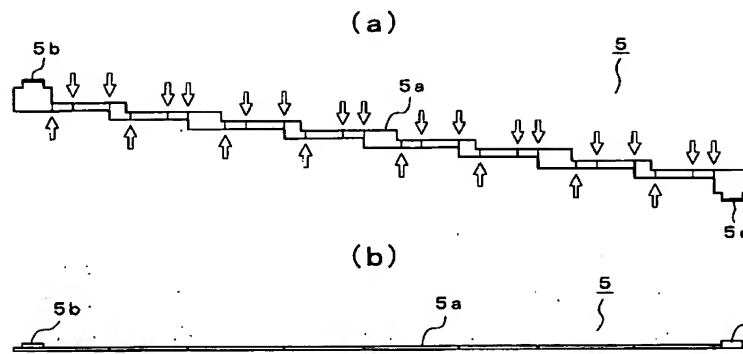
6……テープ

12……C形コア

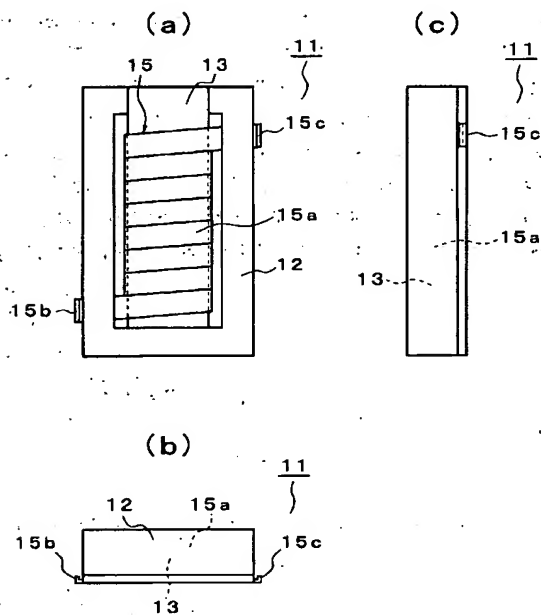
15……段なし帯状の平角線

15b、15c……接続端子部

【図3】



【図4】



フロントページの続き

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